

**Looking to Adopt the Global Data
Synchronization Standard
“Promises, Issues, and Perspectives”**

**A Multi-stakeholder Case Study
of the French Retail Industry**

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Preamble

The introduction of a new technology, such as the global data synchronization (GDS) standard, is a factor of uncertainty that creates unusual problems in sense making for managers and operators (Weick, 2001). As it is ambiguous (Weick, 2001), technology is subject to several interpretations and even misunderstandings (Griffith, 1999). This is all the more likely to be the case when many stakeholders are involved in sense making at different stages of technology design, implementation, and use.

Before sense making, the initiators of the technology engage in “sensegiving” (Gioia and Chittipeddi, 1991); that is, they provide an abstract vision of the proper use of technology that then spreads to the stakeholders. Sensegiving is the process of attempting to influence the sensemaking of users (retailers and suppliers in our case) toward a preferred redefinition of reality. The sensemaking and sensegiving cycles correspond to periods dominated by *understanding* and *influence* or, in other words, cycles of *cognition* and *action* (Gioia and Chittipeddi, 1991; Gioia et al., 1994).

In addition to designers, standard setters and operators, other significant stakeholders take part in the struggle to make sense of new technologies: software companies, technology providers (Swanson and Ramiller, 1997). These stakeholders constitute what Swanson and Ramiller (1997) call the “inter-organizational community,” whose efforts to make sense of new technologies creates the organizing vision of the technology. The latter is the “*focal community idea for the application of information technology in organizations*” (Swanson and Ramiller, 1997, p. 460).

This study seeks to shed light on the extent to which actors across the inter-organizational community have a mutual understanding of the concept, promise, and problems of the global data synchronization standard.

Method

In our attempt to understand the essence of the inter-organizational community's interpretation of the GDS technology, we interviewed fifty nine stakeholders who played significant roles in developing, promoting and using the technology; these 59 interviewees played key roles as representatives of their organizations within the GDS standard in the French retail industry.

We started the study by reviewing the information system (theoretical and empirical) literature about the adoption, use, and implementation of technology at the inter-organizational level. Thus, we were able to set up the interview guide for the different categories of informants. At the same time, this literature review enabled us to conceive the codes for exploring the collected data. All interviews have been fully transcribed and lead to 2,759 minutes (46 hours) of interviews across 59 informants. Data collection took place between March and September 2009.

12	informants at the key informant retailer (Auchan)
6	informants at the 5 other main French retailers
1	informant at the Global Commerce Initiative
4	informants at GS1
2	informants at the two main GDS worldwide data pools
9	informants at 9 IT and GDS-linked service providers
25	supplying informants (for example: Coca-Cola Enterprises, Nestlé, L'Oreal, Kraft Foods, Procter & Gamble, Unilever, Sara Lee, Cadbury, etc.)
59	interviews

We adopted a qualitative methodology based on a multi-case exploratory case study (Yin, 2003) since the qualitative approach is well suited to analyzing dynamic and sensitive events (Lee, 1999), and exploratory case studies are an appropriate means of understanding events in new situations (Yin, 2003), such as the adoption of the GDS standard, the study which has been somewhat neglected in the information systems field. In effect, case studies have been used to account for experiences and outcomes associated with IT introduction in organizations (Orlikowski, 1993),

Moreover, Edmondson stated that “*qualitative research is a useful methodology to investigate phenomena that are not well understood*” (2002, p. 131), since it enables the understanding of a phenomenon depending on the participants' perspective and its particular social and institutional context; this understanding is largely lost when textual data are quantified (Kaplan and Maxwell, 1994). Thus, we hope to benefit from the ability of qualitative approaches to decode complex events (Miles and Huberman, 1994).

During data analysis, we did not mention the origin of the quotation (or the informant details or the company identity). Instead, we simply identify the broader informant group the informant is a part of. These groups are: a) the information technology community (ITC), including GDS initiators (GS1, GCI, 1 Sync, SA2) and IT providers, b) the retail community (RC): the top five French retailers, and c) the supply community (SC).

Although we will preserve the anonymity of our interviewees, representative citations from the groups of informants from will be included throughout the document. Here, we note that since the main interviews were done in French, they have had to be translated. At the same time, taking into consideration our interlocutors' interest in a synthetic report that would enable them to view the study results swiftly, we did our best to make this report as synthetic and informative as possible. In the same vein, citations will be representative of the community sense making of the reality.

This study aims to focus not on the exciting body of business reports about GDS (such as those by Cap Gemini, Ernst & Young & GCI, 2002; IBM Consulting Services, 2004) but on the essence of what the interviewees revealed as being meaningful toward the adoption, implementation and use. Yet, our main aim was to explore the essence of the inter-organizational community's sense making, not to take a quantitative perspective or describe the entire verbatim. In effect, what matters most is whether the constructs exist. For the above reason, quotations will not be followed by percentages or statistics.

Finally, we will recommend some possible ways for the inter-organizational community to cope with the problems and to envision an optimistic scenario for the GDS standard in the French retail industry. The purpose of these recommendations is neither to call into question any community behavior nor to discourage other possible recommendations. In short, the aim of this study is simply to shed light on the reality we grasped at a given point in time. As a consequence, our recommendations suggest the main routes the three communities can take to set up their strategies to get the most from GDS.

***N.B:** This is a confidential report dedicated to the stakeholders who enabled and informed this study. The report is based on the authors' interpretation of the informants' interviews, which have been assigned to three sub-communities. Any errors or omissions are our own.*

Introduction

Accurate product information is a cornerstone of relationships between retailers and suppliers. However, flawed and inconsistent information along the retail supply chain has caused both parties—especially retailers—severe financial losses. In effect, suppliers share continuous reports about their product information with retailers. However, such communication has been hindered by significant errors and flaws. At the same time, the great number of products managed by retailers makes product information management a major concern.

To overcome such a situation, the GDS standard has been identified and presented to the inter-organizational community as the cutting-edge remedy. Our results showed that the inter-organizational community was almost unanimous in interpreting the GDS standard as the second revolution—the first was the development of the Electronic Data Interchange (EDI) in the nineteen-eighties and nineties—in supply chain management. GDS is expected to provide effective solutions to crucial problems that make retailers less efficient and less effective.

RC: *“The GDS standard is clearly a revolution in the supply chain exchanges...it is expected to be as fundamental as the Electronic Data Interchange (EDI) regarding the advantages it is expected to bring and the issues it is supposed to cope with”.*

To help the retail community succeed in adopting GDS, the IT community has highlighted the extent to which GDS is a promising technology that should be able to enhance collaboration all along the supply chain, leading to better performance.

ITC: *“GDS is expected digitizing the entire supply chain, to enable better information quality, to reduce conflicts and to reduce writings...digitizing the entire supply chain process enables acquiring gains in terms of productivity, data quality and consequently on sales”*

Although there is near consensus in the inter-organizational community on the future of the GDS standard, the adoption, implementation and use of GDS were described as difficult, time consuming, and complex.

RC: *“We all know that adopting and using GDS is advantageous for the retailers and suppliers. However, this is not a sufficient condition to enable its adoption and use by suppliers but also by retailers”.*

Consequently, this paper will attempt to determine what went right and what went wrong in the French retail industry’s experience with GDS. The main figure at the end of the report, shows a synthetic picture of the revealed hurdles toward adoption, implementation and use.

I On retailers' and suppliers' reasons for adopting the GDS standard

1. Improving product information

Retailers adopt GDS mainly to avoid the problems of inconsistent, flawed, inaccurate, and outdated product information. Retailers acknowledge that they have no formal, secure and unique means of receiving product information from their suppliers of manufactured goods. For this reason, the product information available to the supplier may be different from that available to the retailer; it may even differ from one retail department to another (business, logistics, accounting, and so on). Product information is drawn up manually, processed with spreadsheets and then sent to the retailers' interlocutors by email or fax. This way of managing information has caused significant back and front office problems for both retailers and suppliers.

RC: *“This solution is expected to generate added value in terms of data quality ... if data is flawed and inappropriate in the beginning of the supply chain, this can lead to significant issues; for example, you can have a 110-cm flat-screen TV for €1 because of an error when writing down product information.”*

SC: *“Obviously, as a manufacturer, I would have a fantastic gain ... this system would send the information to my customers in a manner that enables accurate orders ... we wouldn't have the errors we have with conventional processes.”*

2. Preventing back office problems

From a back office perspective, for both retailers and suppliers, poor product information leads to errors in orders and invoices, excessive time spent retrieving and checking information, duplicate efforts to share the right information with the right stakeholder, price conflicts, added transaction costs to work out payments to suppliers, higher administrative costs on both sides, transportation problems having to do with the possible physical incompatibility of the products with the expected means of transportation and thus, for example, unexpected fuel costs.

RC: *“When logistic information is incorrect because price information is invalid this can lead to conflict and reduce the productivity of our back office teams, because of the mistakes and the time it will take to sort out the issue with the supplier ... other indirect back office issues linked to unaccepted delivery because of conflicting information.”*

SC: *“Product information that differs from one system to another leads to many errors that cause us to waste time checking information ... this is a time-consuming activity for everybody.”*

3. Preventing front office problems

From a front office perspective, poor product information can lead to inaccuracies in the retailers' catalogue, delivery delays, disagreements, inventory shortages, product unavailability, product incompatibility with the retailers' merchandising or sales point layout, and even failure to recognize products at checkout. These problems may lead to retailer dissatisfaction; they may make it hard for retailers to satisfy their customers.

RC: *“Using GDS would enable us to avoid errors that lead to front office problems with our consumers ... many errors such as catalogue inaccuracy, unknown products, inventory shortages ... or maintenance costs and issues such as product unavailability, an unknown Gencode, the consumer will be waiting at the cash register ... these errors would lead to consumer frustration and disappointment.”*

SC: *“GDS would enable controls over the supply chain ... these controls are important because they help us solve problems such as the retailer's refusal to accept goods.”*

4. Cost reduction

Inaccurate product information has led to high front and back office management costs. In effect, retailers manage millions of goods and the costs of dealing with the problems mentioned are significant. The same holds for suppliers, especially for large ones, which manage large numbers of products with a variety of French and international retailers.

Moreover, these shortcomings have forced retailers and suppliers to allot specific resources (human resources, time, budgets, and information systems) to solve problems caused by poor product information. The problem is that these activities add no value from either the retail or the supply perspective; they thus reduce efficiency and lead to lower economic performance. So, retailers initially welcomed a system that would deal with these problems. To cut costs, of course, is the main reason both suppliers and retailers have adopted the GDS standard.

RC: *“Our databases manage millions of articles and 30% of these articles are changed from one year to the next by suppliers ... so what we expect from GDS is that the product information will be correct through the entire operational supply chain to enable proper reception, physical dimensions consistent with what is written in the suppliers' systems ... this would enable us to save significant money that is currently lost in administrative costs ... many human resources are dedicated to cope with similar issues ... it would be worth trying to set up other added value activities ... it will take time to convince our assistant of the utility of the tool ... here it is worth noting that using GDS does not mean any downsizing of our administrative teams.”*

SC: *“Avoiding product information flaws enables me to achieve substantial financial savings, less conflict...for a retailer conflict management means like order from an administrative point of view ... getting rid of this would be translated in terms of enhanced efficiency due to the huge number of goods and items we manage.”*

5. Time saving

The retail community views the standard as an opportunity to save time. First, it would give retailers swift access to reliable, exhaustive and up-to-date product information. Second, it would decrease the number of steps it takes to transmit information from the supplier's databases to the retailer's. Third, it would prevent disputes stemming from incongruent product information. Although these disputes may not undermine relationships between buyers and suppliers, back office resolution of these disputes is viewed as a waste of time. Fourth, suppliers would no longer waste time sending out the same product information to retailers with different formats or process requirements.

RC: *“We sometimes spend hours and days fixing problems linked to product information discrepancies between our system and the manufacturer’s.”*

SC: *“From a sales perspective, buyers can now access product information more rapidly ... before, we were obliged to write down product information and to send it to buyers by email, which was inappropriate.”*

6. Process optimization and simplification

Retailers' processes are complex and involve stakeholders all along the supply chain. Poor information complicates these processes. The retail community expects the GDS standard to simplify its processes by ensuring that reliable information is shared by all the departments in a timely and cost effective manner. In short, both retailers and suppliers expect to share unique and consistent product information that will enhance delivery, optimize stocks, and ensure continuous supply.

RC: *“GDS was here at the right time since it enabled us to call into question many outdated intra- and inter-organizational practices and processes ... adopting GDS means asking many questions in many departments and services and trying to make things more straightforward.”*

SC: *“We have our existing logistic processes but with GDS we expect our human resources and assistants to work out rapidly our product information ... we hope to establish reliable communication and coordination between the two sides ... our processes would certainly benefit from such a change.”*

Taking into account the above-mentioned reasons from the two perspectives, it seems obvious that the initial motivations are here and have sustained initially the industry attention toward the adoption of the technology over the last five years. In spite of this enthusiasm, however, several hurdles must be cleared; they are described below.

II Obstacles to GDS standard adoption

1. *Lost in GDS translation*

Our results show that the inappropriate sense making of GDS are the greatest obstacle to the adoption of the standard. Before examining this obstacle, we must acknowledge that GDS is not a mere technological artifact. Instead, it is a complex system that involves numerous stakeholders and departments on the supply chain, as well as information technology actors.

GDS has been revealed is a confusing term, especially when it comes to such closely related concepts as data alignment and data synchronization. So, some in the retail community simply did not understand some of our questions that used the term GDS. Clearly, then, comprehensive knowledge of GDS is not found on the entire supply chain community. At the same time, GDS has undergone multiple changes in recent years. Nonetheless, some interviewees were familiar with ‘data synchronization’ or ‘data alignment’ but fail to rise up their interpretations about GDS and GDSN. In short, some informants lack up-to-date knowledge of GDS. Sometimes, even with constant involvement in GDS projects and in GS1 meetings, some acknowledge that they still have some trouble understanding some specific technical concepts and jargon. While this didn’t damage their interpretation, it keeps them from grasping the whole meaning.

RC: *“GDS is a complex concept that should make things simpler. The problem is that many stakeholders use jargon explain the concept; they use information technology terms to businesspeople who don’t know these terms ... this explains why some stakeholders do not interpret effectively the concept or don’t manage to get familiar with it.”*

SC: *“Grasping the meaning of the standard is complex; we have to acquire expertise about the standard before understanding its effects.”*

ITC: *“We are aware that the GDS system is technically focused initially and might be ambiguous for businesspeople who want clear-cut, ready-to-use concepts.”*

2. *Catch me if you can!*

Adoption of GDS technology was and still is a retail industry initiative; after all, for the reasons we mention in the beginning of this study, the benefits are expected to redound initially to retailers. For this reason, suppliers believe that French retailers should adopt the technology before they ask suppliers to. In the same vein, suppliers report that they notice no unanimous, regular, and significant movement of French retailers toward adoption of the technology. Instead, they note isolated adoption initiatives by one retailer or another or by the IT community. So, when they see that retailers are not making coordinated efforts to adopt the technology themselves, suppliers quite naturally question the legitimacy of the retail community’s push for GDS adoption. Instead, suppliers feel that each retailer interprets GDS in keeping with its own business and organizational constraints, without any mutual ‘synchronization’ and coordination. Suppliers feel that it is for retailers to begin a wide and harmonized adoption of GDS.

RC: *“Retailers have the same objective: avoiding product information problems. Nevertheless, due to different constraints, we can hardly tend for the exact strategy in terms of synchronization. We have to work further in order to push for industry-wide GDS adoption.”*

SC: *“I can’t understand why the entire French retail industry is not aligned in terms of a general and common policy toward GDS adoption even if they meet on a regular basis to discuss the adoption at the industry level. Consequently, how can they ask the supply side to adopt a system that will be fruitful for us only if all of them have already adopted the system?”*

ITC: *“Each side is asking the other to get the ball rolling ... it is a collaborative technology that should be adopted by both parties. However, the retail side was the initiator of synchronization because it manages more articles than suppliers taken separately.”*

3. Searching for GDS managers

Both suppliers and retailers underscore the great importance of assigning a manager to deal with GDS adoption. Indeed, adopting GDS cannot be managed as a secondary task. As a result of its complexity, it often used to be managed by different stakeholders at the same time, without permanent reporting and feedback to a specific management. So, managing the adoption of GDS falls farther down the list of priorities.

Our data also show the heterogeneity in retailers’ views of the most appropriate department or manager to deal with the GDS project. Indeed, stakeholders from different departments—information systems, logistics, data management, business and organization—are often responsible for the project. Of course, these are appropriate decisions when they are analyzed from an individual perspective since GDS involves all these departments. Nevertheless, because of its nature, GDS involves these different departments **at the same time**. So adopting an individual posture on a case-to-case perspective does away with the intrinsic transversal nature of GDS. Moreover, the other aspect often highlighted by our results is the possible breakdown of communication between the managers of the numerous departments involved in GDS adoption. In short, GDS adoption requires transversal cognition and awareness; it requires awareness by top management.

RC: *“GDS was initially a technical and IT-related issue in our settings. Although I’m convinced of the technical initial nature of GDS, I do not believe that it has to be managed by information systems alone ... it has a business aim and business people are going to use it , so it should be managed by business people. The manager should, however, be aware of the appropriateness of technological choices and the extent to which they influence business outcomes.”*

SC: *“We have been aware since the synchronization got underway that it is a business matter; we wanted to avoid misunderstandings across the organization. Sticking only to the technical perspective is pointless.”*

ITC: *“We are working hard to be able to translate the synchronization subject to each interlocutor. We want to be able to talk to all stakeholders across departments. It needs a lot of explanations and simplification.”*

4. Lack of top management support

Both practitioners and academics have identified top management support as fundamental to the success of project management. Managing GDS standard adoption is no exception. In effect, our study shows that when top management provides support the odds of the GDS's being adopted are much greater than when it does not. Sometimes, in fact, the absence of sustained support from top management keeps even the most determined managers from adopting the technology.

RC: *“Currently, our top management does not think that it is urgent ... we had a presentation but were not convinced of our need to adopt the standard and without top management support we cannot invest seriously in technology adoption.”*

SC: *“Convincing supply side top management of the need to adopt synchronization-enabled technologies is the first step toward adoption of the technology.”*

ITC: *“We know that top management support is crucial for us ... without such support no firm can adopt GDS.”*

5. Buyers' sense making of GDS

Retailers expect GDS technology to have advantages for the entire business, including buyers. However, buyers are not the first and most direct beneficiaries of the GDS standard. As it happens, buyers are the suppliers' main interlocutors, since they manage the business relationship and the negotiation process. Buyers, then, are the most appropriate stakeholder to influence, in a coercive or collaborative way, suppliers' decisions to adopt GDS. But our interviewees report that most buyers did not interpret GDS as being part of their mission or objectives. The stories we collected show that buyers focus mainly on negotiation, requests for quotation, sourcing, and other core business activities. After all, buyers are evaluated by their managers on these criteria, not on their ability to persuade suppliers to invest in a particular technology.

While large firms are convinced of the need to adopt GDS, small- and medium-sized enterprises (SMEs), the majority of French companies, have yet to be convinced of the need to adopt technologies that cross organizational boundaries. The failure of buyers to commit to the GDS project, then, is yet another obstacle. In effect, sales managers at suppliers consider their buyers their main interlocutors; any messages encouraging adoption coming from stakeholders other than the buyer are meaningless, as there is no interaction between these stakeholders and suppliers.

What usually happens in the retail industry, of course, is that GDS managers attempt to persuade buyers, but it turns out that is usually another buyer or the buyer's manager who is most likely to be more persuasive. In short, buyers listen and interpret effectively other buyers' discourse because it avoids technical jargon and focuses on their interests and core business needs.

RC: *“Data synchronization is going to cost suppliers in terms of investments, especially with IT providers ... without the buyers' intervention suppliers won't be motivated to invest money*

and resources in this technology. The fact is that buyers are the first stakeholders who deal with suppliers; it's their role to encourage such projects. Of course, we do not ask them to change the core of their business; rather, they should be more aware of the extent to which IT can benefit their mission even if it's only in an indirect way."

SC: *"The buyer is the only stakeholder who can influence significantly technology adoption...it is the buyer who manages the business relationship and the negotiation process".*

ITC: *"In some cases, with some retailers, you can find GDS teams that report to the master data manager. The problem is that suppliers usually don't know these people, since their main interlocutors are the buyers. Yet, they are the buyers who intervene in day-to-day business and order goods and services from suppliers ... it's not even the buying manager...accordingly, suppliers in many cases don't deal with the people who can influence the most their decision, I mean the buyers. The problem with the buyers is that they do not benefit directly from GDS technology ... it is the supply chain that is expected to get the most out of this technology. Buyers should be involved because of their natural position as the suppliers' main interlocutors".*

6. The business versus the IT perspective

GDS was initially a technical term having to do with the harmonization of business data. Because of its technical roots, some mistakenly believe that it has purely technical repercussions. In fact, our informants declared unanimously that it is primarily a business issue with a technical and information systems foundation. This result means that the technology main perspective is to serve business people dealing with business opportunities and concerns. So, confining GDS project management to technical departments can lessen understanding of the project.

RC: *"Sticking to the technological perspective alone causes problems understanding the technology's business promise ... technology is just the tool; the most important thing is how it would respond to my business concerns."*

SC: *"What is GDS? I understand the simple concept of data alignment but GDS is ambiguous for me. Speaking in only technical terms is an error; the tool has to be understood by everybody."*

ITC: *"This is our challenge: to provide the right technology to meet our customers' business needs. The technology has to be translated into business and practical terms."*

7. Organizational change

Data from both suppliers and retailers showed that GDS is a significant project that requires heavy investment in time, money, software, hardware, and human resources. Designating an organization-wide "GDS manager," in both communities, is an urgent need. For a number of reasons, however, organizational change can happen and then implies the modification of the GDS governance leading to a slowdown in the GDS adoption, a delay in the project or even stopping the adoption process.

RC: *“Changing the manager who has been dealing with the synchronization project from the beginning caused time to be wasted. It took a long time for top management to set up the new configuration of the team that will handle the synchronization project.”*

8. Failure to share synchronization experiences

Our data show that GDS is a complex technology, the adoption of which requires the cooperation of many stakeholders. However, different departments can have different synchronization experiences without systematically disclosing best or worst practices. This failing is largely due to the absence of a “GDS manager” who can guide organization-wide adoption of the technology, makes it impossible to benefit from the experience of others and enables organizational learning.

RC: *“There are different synchronization experiences with different formats in numerous departments and services. However, there is no unique management of all these experiences.”*

9. Costs and the return on investment (ROI) imperative

Like any project, GDS necessitates investment and management; as always, a rapid return on investment is required. The problem is that the complexity of the GDS project and its involvement in a number of interrelated back office and front office processes precludes this rapid return. Adoption of the standard is also viewed as synonymous with financial costs that SMEs find hard to bear. Retailers, it seems, have a tendency to recommend technologies that, in the short term, fail to provide suppliers a return on investment. Moreover, our informants stated that, because of their limited financial resources, SMEs cannot systematically send their representatives to GS1 meetings. Yet all stakeholders recognized that these meetings are crucial, since they make it possible to discuss the future orientation of GDS in the French retail industry.

RC: *“For a long time, the question was about ROI. To convince our top management to dedicate human and financial resources, we can’t just say it’s the next major fashion or trend in the supply chain. The problem is that the main studies, such as the Cap Gemini Business case, do not stress a specific case of one or more French firms that invested in GDS and got an ROI.”*

SC: *“SME firms dot have the huge financial resources that can be dedicated to technologies such as GDS...not all suppliers can attend GS1 meeting nor share other big suppliers’ or retailers’ experiences.”*

ITC: *“The problem is that some suppliers, notably SMEs perceive us as being a kind of tax that they have to pay ... the key issue is that our added value is not entirely perceived ... some suppliers say: you are a tax, you cost a lot and you don’t provide added value for my business ... hopefully, we work to avoid such false interpretation.”*

10. Qualitative promises

Most of the promises made by the IT community were perceived as qualitative, almost never quantitative. For example, business reports that mention general benefits, such as streamlining the supply chain or improving back office productivity, are almost meaningless for managers who must decide the extent to which they will invest in GDS. In difficult economic times, these qualitative promises make less sense for operational managers and top managers, who, in such times, are more than ever in search of concrete, empirical gauges of the efficiency of their businesses.

The retail community stated that the documentation provided by such entities as Global Commerce Initiative and GS1 played key roles in helping convince top management and in kicking off the GDS project. All the same, now that retailers are struggling to get suppliers to adopt GDS and with other practical challenges, they would like to see empirical studies of the quantitative outcomes of GDS use on both ends of the supply chain. The retail community believes that quantitative results alone will boost its powers to persuade its supply base and to ensure broader adoption of the standard.

RC: *“There was an initial case study done by Cap Gemini, commissioned by GS1, to show the extent to which adopting and using GDS can be profitable to business...this business case was extremely useful initially...the problem is that these promises are still qualitative ... we need empirical, concrete quantitative examples of firms that invested in GDS and the extent to which it helped them reduce inefficiencies.”*

SC: *“It is not easy to meet quantitative expectations in the first stages of the project ... it is very complex, since plural processes and departments are involved.”*

ITC: *“Retailers saw the benefits linked to digitization and were thus determined to adopt such technology. However, at first glance, the benefits of GDS are less obvious, less tangible.”*

11. The economic downturn

The recent economic downturn has bred a lack of strategic vision that has kept some top managers from making investments not essential to their current core business. GDS projects were among the investments that were frozen. Moreover, in some cases, GDS is still perceived as not vital to global retail/supply business; it is perceived simply as a technological artifact that might have some benefits but whose realization is not necessary. In these gloomy economic times, then, the GDS project has been postponed indefinitely. Some explain that they need time to see how those how early adopters would take advantage from GDS while hoping that until this time, the crisis would be over.

RC: *“Clearly, in troubled economic times, the trend is to cut expenses and investments that are not crucial in the short run. GDS can be understood by some retailers as one of these non-essential investments...however, if we figure out that some players get advantage from the system...then we’ll think it over”*

ITC: *“The economic crisis was not helpful for synchronization-enabled technologies ... some suppliers, SMEs in particular; think that our services do not bring rapidly ROI.”*

12. Firm size

Another hurdle to clear before GDS can be adopted is its relative lack of appeal to SMEs. Adopting GDS is clearly beneficial to large corporations, with the large number of products they manage in conjunction with retailers. However, SMEs may view the smaller number of goods they manage as an obstacle to the adoption of GDS, since the expected benefits would redound primarily to the retailer.

RC: *“It’s more difficult to convince SMEs because they do not see how GDS will benefit them directly ... their limited number of articles can explain this situation. However, we still need their help to realize the expected benefits of the system.”*

SC: *“Obviously, it’s easier for a large supplier to adopt GDS than for an SME. These firms need financial support that is sometimes lacking. So, in many cases, SME perceive synchronization not following the standard perspective but following the simple web forms perspective.”*

ITC: *“The problem is that GDS is expected to offer advantages to improve the firm’s back office. While these advantages can provide valuable outcomes in the front office, they may only make sense to large firms. However, small firms do not see the benefit of investing in back office issues since they want concrete and immediate returns on investments.”*

13. Forced to collaborate

GDS has been presented to the entire inter-organizational community as a collaborative standard that would, to the benefit of all, synchronize business data along the supply chain. But some suppliers, especially SMEs, see nothing collaborative about GDS adoption. Some suppliers even reported that their interlocutors, buyers, exerted coercive pressure; they were given an ultimatum: adopt the technology or be rejected.

SC: *“I don’t think that most buyers got the message of the technology being collaborative. We don’t see any enhancement in our business relationships. Worse, some force their suppliers to adopt the system using threats of stopping relationships if they do not do so.”*

ITC: *“some in the retail community pressured suppliers to adopt the GDS standard.”*

While adoption is believed to be the most significant step to benefiting from the technology, the implementation and the effective use of GDS are also challenges. In the following section, we describe these particular challenges.

III Obstacles to the implementation and use of the GDS standard

1. Co-existence of multiple synchronization formats

The adoption of the GDS standard was the supreme goal of both retail and supply communities, as it is the ultimate solution to many major business problems. However, caught up by everyday problems, the retail community has adopted plural ways of synchronization to enable all categories of suppliers to synchronize their data. While the co-existence of different forms of synchronization was motivated by a desire to free suppliers from costly GDS investments, the supply community views this co-existence as confusing and as a serious obstacle to the adoption of the standard.

By the same token, suppliers indicate real synchronization operations have rarely taken place, and that when they do it is almost always for durable goods. Promotion, the other mainstay of the business, is based almost entirely on point-to-point (P2P) synchronization. This detail is viewed by the supply community as a way to negotiate the use of the technology and to circumvent the standard.

Some in the IT community view P2P solutions as an operational mean of satisfying data alignment requirements until a critical mass of suppliers and retailers adopts the GDS standard. Others believe that they are a sophisticated mean of getting around the standard, which has always been the ultimate goal, and that pursuing P2P solutions would delay implementation of the GDS standard indefinitely.

RC: *“Retailers have operational business needs and the most important thing is to get the data synchronized ... the different synchronization possibilities are a solution to product information problems. But they are an obstacle to the real standard.”*

SC: *“It is abnormal that we still lost in different synchronization formats. During GSI meetings, the message is to converge as soon as possible on the real standard. Using the P2P system is a way of getting around the real standard. We are far from adopting the real standard.”*

ITC: *“The co-existence of many synchronization-enabled formats can be perceived as both an opportunity and a hurdle ... those who are seeking pure GDS may see P2P solutions and others such as web forms as hurdles toward the standard adoption ... some think promotion is better achieved through P2P, since GDS is not mature yet. There are two types of data flow: permanent-based information and promotion-based information. 80% of the data flow is promotion-based information and not all stakeholders can tolerate pitfalls or issues due to the significant financial stakes. Thus, the GDS is used for permanent-based information ... this way of doing things circumvents standard use and we are struggling between these two ways of synchronizing data.”*

2. Making sense of the IT providers' offers

The introduction of GDS was viewed by IT service providers as a significant opportunity for setting up new business models or enlarging existing ones. Because of the emergent aspect of the market, however, the variety of value added services offered by these providers makes it harder for some suppliers to choose. Suppliers also acknowledge that they need IT providers to give simplified sense of GDS and synchronization-enabled technologies for business people. At the same time, the ITC highlighted the need to avoid driving down prices and services through a pure focus on the technique and the carelessness of the business added value.

RC: *“In synchronization technologies, IT firms have identified an opportunity to set up and/or extend their business models. Some suppliers can struggle with the appropriate choice.”*

SC: *“Understanding all the offers and services linked to synchronization and GDS suggested by the IT players is difficult. Between all players and everything else, we can be lost in choosing the right technical solution.”*

ITC: *“Several of us are involved in the GDS standard market and there are two main problems. The first is that some opted for low-cost models and this can drive down prices for all IT services based on GDS. The second is that there are many firms that suggest different approaches to delivering added value for GDS investments and customers (suppliers) may get confused. Which solution is better? Why? What criteria should we take into account to make a decision about the solution to choose?”*

3. Technical problems

Technical problems were blamed for delays in GDS projects in both retail and supply communities. Indeed, partly because of these problems, implementation of GDS is viewed as a long and sometimes never-ending process, of which only the initial investment in time and resources is known. The problem with implementation is the number of stakeholders (suppliers, retailers, and IT providers) involved, a large number that can make it hard to identify the best way to solve technical problems. In addition, both retailers and suppliers rely on complex information systems that do not lend themselves to swift adoption of GDS.

RC: *“Technical problems caused projects to be dropped initially. The problem is that you start tests with suppliers and with these problems you lose motivation ... the problem is that you may see no end in sight to the implementation and you get discouraged.”*

SC: *“It is a complex technology that contains complex issues when moving to the implementation phase, especially in the initial stages ... the IT provider's help is important here.”*

4. Specific attributes of retailers

Sending out standardized information for the entire retail community and thus coping with retailers' specificities was one of the major business aims of GDS. However, some retailers

use GDS but, at the same time, ask their suppliers to meet other specific information needs. Suppliers had trouble understanding why retailers demand the standard and, at the same time, ask them to deviate from it.

RC: *“This is our community’s problem. We have trouble setting up agreements that would be applied by the entire community ... this is the case, for example, for attributes, since some can have their own specificities.”*

SC: *“No retailer is really applying the standard as it should be ... for me, this is the major obstacle. In the end, even with synchronization, we still need to meet some retailers’ specific needs in terms of attributes. This will lead to the death of the standard.”*

5. The number of attributes

French stakeholders in GDS, including the representatives of the three communities, decided to opt for a rich format that integrates a large number of attributes. The idea was to have a comprehensive standard that would meet all business needs, while laying the foundation for future uses such as RFID (radio frequency identification) and mobile commerce. Our interviewees said that this choice was responsible for delays in the implementation of GDS.

RC: *“Contrary to the American way of adopting GDS, France has chosen to include a much bigger number of attributes in order to provide more meaning to the system and to enable other future potential use. This can explain why we spent so much time for make the GDS a reality in France”.*

SC: *“Yes, the number of attributes was a parameter we had to cope with when starting the synchronization work with our first major retailer ... some think that it was a hurdle, but I don’t.”*

ITC: *“It’s the main difference with the American context. Here, the number is higher because France has a long-term perspective not just for GDS adoption. The aim is to benefit from the system for future applications such as RFID and mobile commerce.”*

6. Getting around GDS

Some suppliers reported that they have responded to retailers’ encouragement to adopt GDS. But they were surprised to continue receiving information requests through media—email, fax—that GDS was supposed to supersede. Some suppliers even said that, months after completion of GDS, some retailers were not using it.

SC: *“The problem is that we are connected but our retailers continue to ask for product information by email. It’s just getting around the system. In another context, we have a retailer we’ve been connected with for several months, but it just doesn’t use the system.”*

ITC: *“20 to 25 suppliers use the real GDS. However, as the standard is still imperfect sales assistants still have to complete data synchronization through systems such as web forms or*

P2P synchronization ... with this last solution, suppliers avoid making other data writings ... the problem is that the GDS standard is circumvented.”

IV Best GDS practices and means of coping with GDS problems

We highlight below practices that would help organizations adopt GDS and use it effectively.

1. Best GDS practices

1.1 Top management support

Retailers and suppliers agree that top management understanding and consistent interpretation of GDS outcomes are the main ingredients in successful adoption and use of the standard: they determine the resources that will be made available for the project. At the same time, including buyers in the process was identified as a key condition.

RC: *“We tried hard to prepare a presentation to convince our top management and it worked ... we were aware that such support is crucial to adoption of GDS.”*

SC: *“Our top management played a key role in GDS adoption ... it was involved from the start in the GDS steering committee ... this involvement enabled us to access the necessary resources.”*

ITC: *“Top management support is crucial for GDS adoption ... with the integration of formal objectives for buyers to facilitate and support GDS adoption and implementation, it would work.”*

1.2 GDS management

Once the top management support for the GDS project is secured, the appropriate manager must be chosen. Since GDS is interdisciplinary, our informants believe that the GDS manager must have both technical and business expertise. Choosing the right team to help the manager is also a fundamental step in seeing the project through.

RC: *“It wasn’t the case initially but because of the pitfalls faced in the first synchronization endeavor, we realized that GDS was a transversal project that needed a cross-functional team aware of the fundamental importance of combining business and IT.”*

SC: *“If we want GDS to succeed, it is necessary to bring together all the key stakeholders to work on the project ... we had people from information systems, logistics, the supply chain, organization ... we were lucky since our top management trusted our enthusiasm for GDS and enabled a rich team to work together.”*

1.3 Business process reengineering (BPR)

Some of our informants were aware of the extent to which the GDS standard, as a result of its transverse nature, is an opportunity to call into question current business processes. Indeed, GDS is not simply an IT matter; it has implications on almost all organizational departments. So, although the original objective was not to re-engineer business processes, some interviewees stated that their organizations can use GDS to analyze their current processes and think about BPR operations.

RC: *“We are starting a BPR experience at the organizational level...it is not the direct consequence of GDS. However, some questions/challenges linked to GDS would be answered by this project.”*

SC: *“Since the initial project deployment, I spoke to the operational committee about the value of internal information. Consequently, we decided to look into the extent to which GDS deployment would enable BPR.”*

ITC: *“Our mission is not only to enable our customers to use synchronization-enabled technologies. Rather, we work hard to help our customer get the most out of GDS ... for that reason; we assist our customers with key questions emerging from the technology we provide.”*

1.4 Buyers' involvement

Our informants said that, even though buyers are not the primary beneficiaries of GDS, they play a key role. In effect, their privileged position as the first direct interlocutor of suppliers gives them the ability to influence suppliers' attitudes and to persuade them to take part in joint IT projects such as GDS. Consequently, the retailers which convinced their buyers to invest in promoting GDS found their suppliers more likely to adopt the technology.

RC: *“Generally, our buyers were not involved in the GDS project ... they think that it's not their business. However, some key buyers' managers understood the technology and were aware of the fundamental role buyers play in GDS, even though they are not the primary beneficiaries. Buyers are the suppliers' major interlocutors and have to be aware of everything that happens from all perspectives. Buyers' managers, who sponsored GDS, helped us by spreading the word to buyers.”*

SC: *“I believe that GDS is one of the main things to be discussed by our sales managers and the retailers' buyers ... it is so important for both of us. We expect better collaboration between the two sides and this won't be possible without including GDS in their agenda.”*

ITC: *“The retailers that got the most from GDS are those whose buyers were involved from the beginning of the process. Their buyers were concerned with the success of the system ... I've seen this happen several times ... It can have implications on sales.”*

1.5 Connecting business and IT

All our informants made known that GDS is chiefly a business issue founded on IT infrastructure and techniques. So, although the project may be rooted in IT logic, its aims are commercial, and for this reason it requires the involvement of both business (suppliers, buyers, etc.) and IT stakeholders. One successful practice involves systematic interaction, in formal settings, of business and IT stakeholders.

RC: *“Thinking that GDS was a purely technological issue was a great mistake ... IT is just the tool that serves business purposes ... the new GDS team is aware of this and is trying hard to get the people from sales and IT to work together.”*

SC: *“Technology is important but in the end it is just a tool. In our firm, all departments involved talk to each other ... we plan formal occasions to communicate.”*

ITC: *“GDS must be understood as key solution from the business perspective and from the IT perspective ... in the end it is just a tool that serves business needs.”*

1.6 The role GS1 and the GDS Tour de France

The inter-organizational community believes unanimously that GS1 plays a key role in the success of GDS in the French retail industry. GS1, after all, is largely responsible for standard design, upgrades, and so on. The documents, business cases, and videos produced by GS1 and made available to the inter-organizational community also help generalize GDS and other standardization matters.

In 2008, with the help of representatives from the inter-organizational community, GS1 set up meetings and presentations through the 2008 GDS Tour de France to promote the benefits of GDS and encourage its use. The 2008 GDS Tour de France received significant attention; it played a key role in promoting GDS to SMEs. This democratization of GDS enabled SMEs to grasp the essence of GDS and its possible ramifications on their business.

RC: *“GS1 has been playing a key role in establishing the GDS standard ... the Tour de France increased awareness of GDS. It would be very interesting to have similar events in the future to spread the word.”*

SC: *“Size is a major factor in GDS adoption. Initially, SMEs were less likely to perceive the benefits of GDS. Through endeavors such as the Tour de France, the community can meet these suppliers. I think that it’s not easy to reach SMEs through conventional media ... events, such as GDS Tour de France, are more appropriate.”*

1.7 Customized offers

Synchronization of product information on the entire length of the supply chain has enabled the emergence of a new market for information technology whose goal is to meet the needs of suppliers and retailers. Aware that the cost of GDS may be prohibitive for SMEs, IT providers suggested offers tailored to the firms' size, budget, and synchronization needs. However, some in the IT community fear that dropping prices and offering low-cost strategies in response to reduced investment budgets can have only short-term benefits and that this response would make it harder to provide anything other than mere synchronization, with no added business value. And business value, of course, is what retailers and suppliers expect.

RC: *"I don't think that SMEs and large suppliers have to invest the same resources to get the most from GDS ... IT solutions must be tailored to the size and the constraints of suppliers."*

SC: *"I believe that IT providers are doing a good job by putting forward offers that are tailored to suppliers' expectations and budgets. Otherwise, SMEs would not adopt GDS."*

ITC: *"Initially, we were key players in the emerging synchronization-enabled technologies markets. We noticed new entrants with other offers ... this is competition. However, when such competition starts bringing prices significantly down, and only to enable basic synchronization with no added value, it endangers the entire market. In troubled economic times, taking this market down may confuse customers, bring down the prices for synchronization services, and make it hard to sell added-value services. We realize that suppliers need customized solutions, but customizing does not mean a low-cost perspective."*

1.8 Return on investment

Having the possibility of proving on the ground the extent to which the GDS technology can help organizations coping with their supply issues, through return on investments calculation and estimations, was identified as a very important criterion that makes sense toward all the inter-organizational community. The IT providers which were able to do so had success with their customers since they were able to translate the synchronization enabled technology in a business solution able to trigger added value. At the same time, our informants think that in addition to IT providers, they expect GS1 to provide key examples of firms that adopted GDS and have had success. For such mission, they would like up to date quantitative reporting of French firms across different settings (SME, big suppliers, retailers)

RC: *"It was the first criterion for top management. As a project team, we have to show our ability to make this calculation for those who allocate resources. Succeeding in the initial evaluation of ROI, giving the main indicators, is critical to GDS adoption."*

SC: *"ROI is extremely important. However, it's not easy for suppliers to estimate ROI since GDS is based on numerous stakeholders and departments. It will take some time before the return on GDS investment can be determined. At the same time, we know that we have to move forward and to adopt the system."*

ITC: “My company offers the possibility to calculate approximately the ROI for retailers and suppliers ... not all the IT providers can do that ... we realized that this constitutes a competitive advantage since ROI is crucial for convincing IS managers and top management to invest and to allocate resources to IT projects such as GDS.”

1.9 GDS and the green supply chain

Green management is a currently fashionable and has been linked to GDS. Some interviewees acknowledge that optimization of supply data could optimize transportation and thus reduce carbon emissions. Indirectly, GDS can also nudge retailers and suppliers toward greener practices, in line with their possible social and corporate responsibility initiatives.

RC: “GDS will enable us to use transportation in an efficient way ... indirectly, this would enable us to benefit the environment ... it’s interesting to see that IT can benefit the environment.”

SC: “Obviously, GDS can enable optimization of deliveries for retailers...green effects can be expected.”

ITC: “Let’s imagine a retailer who is planning to pick up the ordered products from the supplier’s plant and imagine that they share different information about the pallet dimensions; the retailer may use more trucks than necessary and release more CO².”

In the following section, we recommend several ways for the inter-organizational community to take greater advantage of GDS. They are by no means the only ways of doing things; indeed, they may need to be tailored to provide a good fit for each stakeholder.

2. Means of coping with GDS problems

The adoption problems	Solutions
Lost in GDS translation	<p>Writing business-focused document that simplifies the GDS concept, main related stakeholders and terms to the inter-organizational community (within and between all stakeholders).</p> <p>Organizing added-value initiatives similar to the “2008 GDS Tour de France.”</p> <p>Arranging unified adoption initiatives that involve all the retail community and avoiding separate initiatives.</p> <p>Enabling wide access to reporting linked to the GS1 meetings, events, and initiatives (national and international) through broadcasting on GS1 website to the largest possible supplier base, including SMEs.</p>
Catch me if you can	<p>It is up to the retail community to show its commitment to GDS. Once major retailers have adopted GDS, it will be up to the supply community follow suit.</p>
Looking for GDS managers	<p>Choosing a manager who can deal with both business and IT communities.</p> <p>Choosing a GDS team that represents all the departments directly and</p>

	indirectly linked to GDS. Rewarding the GDS team for concrete efforts to promote GDS because of the expected business benefits.
Lack of top management support	Using ROI schemes to convince top management of the importance of the GDS standard not only in the long run but also in the short run. Looking for the help of an IT provider/consulting firm able to provide measures based on empirical and quantitative scales. Ensuring regular feedback to top management to guarantee continuous support.
Buyers' sense making of GDS	Enabling buyers to understand and promote GDS to their supplying interlocutors. Giving buyers incentives to do so since it includes both sense making (interpreting the phenomenon) and sense-giving activities (influencing others' behavior).
The business versus the IT perspective	Asking buyers already aware of and supportive of GDS to promote the technology not only in their organizations but also across their organizational boundaries (GS1 operations, meetings such as the GDS Tour de France).
Organizational change	Choosing experienced GDS manager to avoid changes in project management. Otherwise, ensure effective reporting to the new manager.
Failure to share synchronization experiences	Using the management team to learn from others' mistakes and to accelerate the learning process at the organizational level.
Costs and ROI perspective	Asking IT providers for their help working out ROI schemes for accurate and reliable ROI calculations for top management
Qualitative promises	Turning qualitative promises into quantitative promises. Being aware that this work transcends mere synchronization and is an added-value consulting service that needs to be rewarded separately.
Economic downturns	Economic downturns can be the time for top managers to ask questions they previously had no time for. GDS figures among these questions because all the experts estimations. Signs of an economic rebound should encourage firms that fear no return on GDS investment.
Firm size	Giving SMEs incentives. Organizing joint initiatives in the retail community to reach the community rapidly and in a cost-effective manner.
Forced to collaborate	Reminding buyers of the collaborative nature of the GDS technology.
The implementation/use problems	Solutions
Co-existence of multiple standard formats	Trying to avoid the confusing co-existence of multiple formats through joint retailers' initiatives that harmonize their synchronization needs. Organizational rules that invalidate product information transmitted by means other than GDS.
Making sense of IT providers' offers	Translating GDS into business terms rather than technical terms for retail and supply-side stakeholders. Setting up alliances between IT providers on the specific GDS perspective.
Technical problems	GS1 endeavors helped firms to overcome these hurdles. Founding a GDS knowledge management database at the industry level would help resolve recurrent technical problems.
Specific retailers' attributes	Reaching agreements under GS1 supervision between the supply and the retail communities.

The number of attributes	A strategic choice, this criterion will be hard to change. However, sticking to the only accepted attributes would help suppliers move forward in their synchronization policy.
Getting around GDS	Reporting to the GDS team all the synchronization experiences in firms and setting up a “GDS charter” to promote the effective use of the technology.

V After GDS: RFID, mobile commerce?

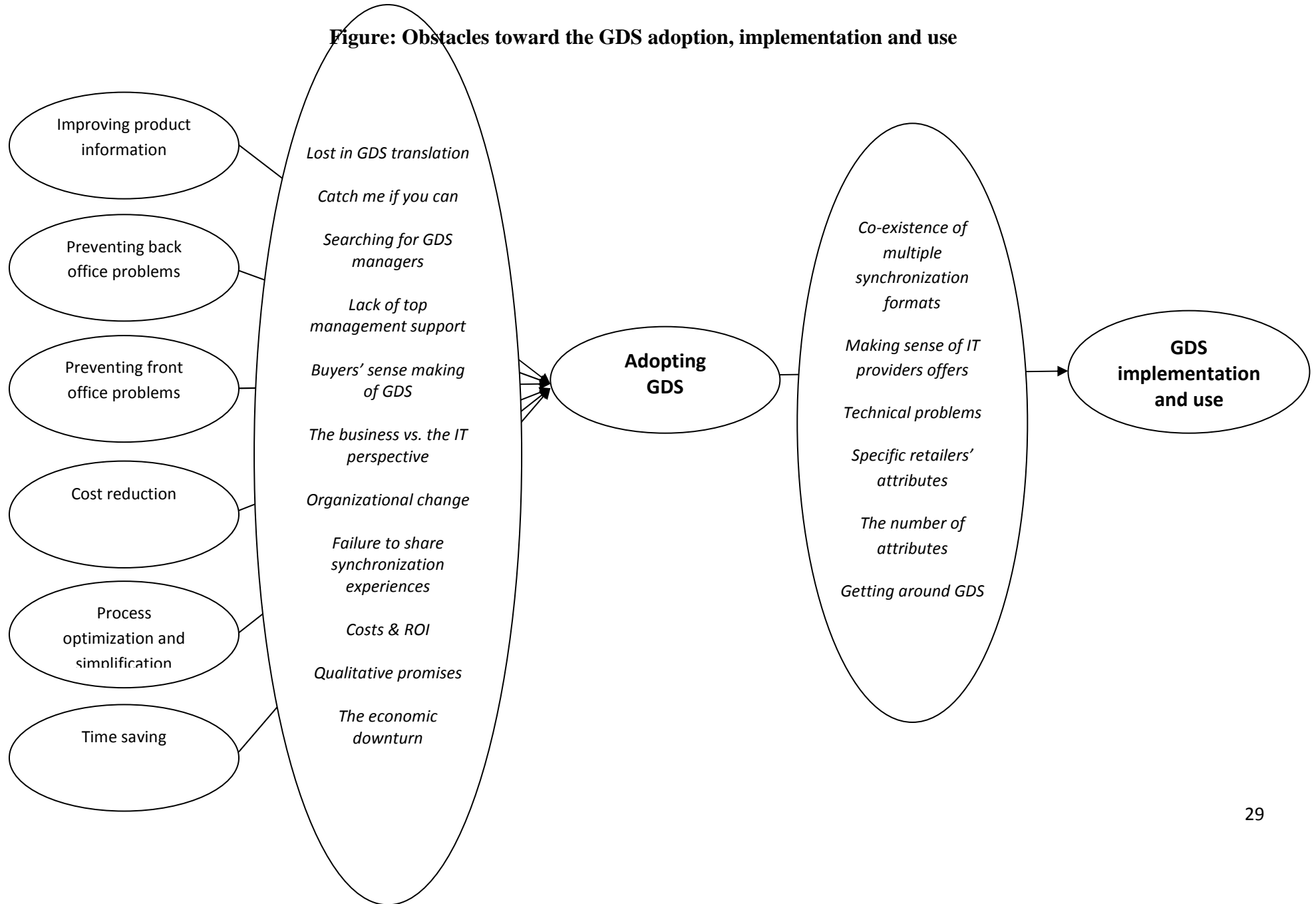
Our informants identify RFID and m-commerce as the main future opportunities from which the French retail industry can benefit after it meets the challenge of GDS. In effect, the retail community and the IT community have similar expectations about the extent to which GDS, as a result of the data it manages, can generate added-value externalities. This optimistic view of RFID and m-commerce, however, is not shared by the supply community. These developments are viewed as costly; for this community, the business benefits in the medium and long term are unclear.

RC: *“Clearly, the success of GDS is a keystone for the future success of promoting technologies such as mobile commerce and RFID...GDS would furnish the ideal database for sharing the critical information both retailers and suppliers need”.*

SC: *“I have heard about RFID and m commerce initiatives in France...but due to their costs and lack of perceived benefits, their adoption is not on the supply community agenda”.*

ITC: *“Undoubtedly, these are the technologies of the future...GDS success is a fundamental condition for envisioning RFID and m commerce”.*

Figure: Obstacles toward the GDS adoption, implementation and use



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